How Teacher Attitudes Affect Technology Integration

By Robert Kadel

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It is a fair assumption that most teachers in the United States have, by now, had some exposure to technology in the classroom. And most educators who have worked with technology in their schools will likely agree that simply *having* technology doesn't guarantee its effective use. "You have to have the right attitude toward technology," one practitioner told me, referring to teachers in her school, some of whom embraced technology integration and others of whom thought it was a bunch of hooey.

It's easy to say that one must have "the right attitude," but how much do we really understand what that means? Researchers have been working to answer this question for at least the past few years. For example, take a look back at Henry Jay Becker's seminal 1998 *Teaching, Learning, and Computing* survey. And, in 2000, Becker and Margaret Riel showed us that teachers who can be classified as coming from constructivist learning theory are more likely to use computers more often and in a more exemplary fashion. (***Editor's note:*** Find more about these studies under Resources on p. 47.)

But as we know, no single researcher can answer a broad, overarching question such as "What is the right attitude?" It takes many researchers working on different projects over a span of time, each contributing their own pieces to a large puzzle.

Recently, some new pieces have been added to the puzzle, and they're worth a closer look. In vol. 36 no. 3 of the *Journal of Research on Technology in Education (JRTE),* an article by Rachel A. Vanatta and Nancy Fordham builds on Becker's work. (***Editor's note:*** The supplement to this article contains this and other *JRTE* studies mentioned here.) Vanatta and Fordham took 177 K–12 teachers in New Hampshire and administered a survey that asked about a range of factors. Among them:

- Two contrasting pairs of teaching philosophies: teacher-centered versus student-centered, and constructivist versus traditionalist
- Teachers' self-efficacy—that is, how much do teachers believe they can affect student outcomes?
- Openness to change

The authors also asked questions about professional development, technology training, different uses of computers (by teachers and students), gender, and number of years teaching.

The idea behind this survey, and so many others like it, is that to conduct a thorough examination of what makes teachers tick, researchers must ask all kinds of questions, even those that don't necessarily relate to what the researchers are focusing on: "teacher dispositions" and their effect on technology integration. So Vanatta and Fordham asked lots of questions, all of which may effect classroom technology use. The idea is to come to sound conclusions by making sure that they covered all their bases. So if somebody goes up to Vanatta or Fordham and says, "Hey! How do you know that a teacher's philosophy doesn't have an effect on classroom technology use?" they can say, "Because we asked about that using a range of questions on our survey, and we found there was no effect."

How do they know there was no effect? They took the responses to some 71 survey questions and boiled

them down into about 10 factors that could contribute to classroom technology use. Then they used what's called *regression analysis* to determine which factors had significant effects on classroom tech use.

Regression analysis is a statistical procedure that allows the researcher to gather together a group of "causes" and compare them to see how much they cause a particular effect. An easy example is income. Call it the *effect* or the *outcome;* a ton of variables cause higher or lower incomes (e.g., level of education, status of one's job, location, demographic factors). Regression analysis can be used to determine which of these variables causes incomes among a bunch of people to vary, and how big an effect each has.

So Vanatta and Fordham used regression analysis to determine which factors on their survey caused teachers' classroom tech use to increase or decrease. They found three significant causes: the number of hours teachers put in beyond their contractual work week, the number of hours of technology training teachers had received, and teachers' openness to change.

What can we take away from this? In this case, we see that it takes a certain get-up-and-go attitude. Teachers must be willing to try new things in the classroom, as opposed to adopting a rigid pedagogy that cannot be shaken. And it takes some personal investment, specifically in time—more time for technology training and more time beyond regular classroom hours, presumably to learn the new technology that arrives every so often.

But, there is more to this puzzle than just the classroom teacher. Two other recent studies in *JRTE* (by Ling Wang and colleagues in vol. 36 no. 3 and Mitchell Shuldman in vol. 36 no. 4) discuss how preservice teacher training and superintendents' perceptions of teacher attitudes can affect technology integration in schools.

Wang et al. used a type of quasi-experimental design to determine how two things affect preservice teachers' efficacy in integrating technology into their teaching. The first was vicarious learning experiences—in other words, learning by putting oneself in another's shoes, listening to stories, and looking at evidence of another's instructional practice. The second was the practice of setting goals and determining what would be needed to achieve those goals.

Nearly 400 preservice teachers took part in the research. The participants were randomly assigned to one of three treatments or to a control group. One treatment group received vicarious learning experiences, another goal setting, and the third both. The control group received neither.

Participants received vicarious learning experiences through the use of the VisionQuest CD-ROM, which gives six teachers' experiences integrating technology into instruction. The teachers come from different backgrounds and teach in different settings, with different resources at hand. Through video and artifacts, participants learned how each teacher achieved a workable technology integration in his or her classroom.

Participants in the goal setting group explored certain WebQuests that asked them to "keep in mind what you are trying to do." In other words, participants were asked to determine their instructional goals and how they might achieve them.

Using surveys to determine preservice teachers' self-efficacy toward technology integration, Wang et al. determined that those who were exposed to both vicarious learning experiences and goal setting had the highest degree of confidence in their abilities to incorporate technology. Participants who were exposed to vicarious experiences but no goal setting had slightly higher self-efficacy than those who were exposed to goal setting but no vicarious experiences. And, as you might guess, participants who received neither exposure had the lowest degree of self-efficacy.

So we're getting a clearer picture: current teachers require investments of time and energy and an openness to change. Preservice teachers need to set goals and learn from others' experiences. What do administrators think of the issue of "the right attitude"? Shuldman conducted in-depth studies of three school districts in New Hampshire, interviewing their superintendents at length. He started first by collecting information from each district about its organization of technological resources, by interviewing teachers, a director of library services, and a high school principal, and by conducting observations of technology use in school computer labs.

This was all background work for Shuldman, who needed to gain a full understanding of the technology use in each district to construct useful questions for the superintendents. What he learned from these interviews was, first, that multiple levels of leadership are needed: superintendents must work to gain the support of teachers, the school board, and the community. Informed, well-trained technology leaders are needed at the district level and within schools. And perhaps most important, Shuldman concludes that "These superintendents believe there can be no effective systemwide integration without the direct involvement and leadership of the building principal." What is clear from this is that leadership must be coordinated. Everyone must be on the same page and have the same goals.

Shuldman also found that teachers need adequate time and increased funding for technology integration. Most of us would agree that these are essential, but difficult to come by.

Finally, Shuldman's interviews yielded evidence that teachers must

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understand how new technologies relate to their teaching and how they can be applied in the classroom. This is perhaps similar to Wang et al.'s discussion of vicarious learning experiences—"Okay, I see the technology, but what does it mean to me? What am I supposed to do with it?"

If we answer this question for as many teachers as possible, we are one step closer to widespread, effective technology integration. We also know that teachers need time, even if it's a personal investment of their own time, and a willingness to try new technology. Further, it is important to set goals for your own technology use.

These are just a few more pieces to the jigsaw puzzle that is "understanding teacher attitudes." But given time, dedication to research, and a commitment to understanding ourselves as educators, we'll get that puzzle filled in. I know we can, because I've learned from others' experiences, and I've set a goal to do it!

Resources

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